



74

TECHNOLOGY
& ENGINEERING
EMMYS®

APRIL 16, 2023
Vũ STUDIOS LAS VEGAS



CONGRATS

TO OUR

Technology Dream Teams

We are proud that the technologies we're developing for our customers are helping us continue to make a difference in their lives by delivering on our company mission to "...connect millions of people to the moments and experiences that matter most."

We are honored to be recognized by the National Academy of Television Arts and Sciences with two Emmy Awards for Technology and Engineering:

**Pioneering Development and
Deployment of Virtualized Cable Modem
and
AI-ML Curation of Sports Highlights**

Many thanks to our teams and industry partners who contributed to the development of these technologies and to all of our teammates who continue to drive innovation for our customers.



WELCOME

A MESSAGE FROM
THE CHAIRMAN,
TERRY O'REILLY

As the Chairman of the National Academy of Television Arts & Sciences, it is my great pleasure to welcome you to the 74th Annual Technology & Engineering Emmy® Awards!

As I sit down to write these comments, I find myself focused on the passing of an industry giant, and the anniversary of a technological breakthrough.

The giant to whom I refer is Gordon Moore. Moore was an engineer and businessman — a co-founder of Intel Corporation — and the man for whom “Moore’s Law” was named: the observation that the number of transistors in an integrated circuit doubles every couple of years, resulting in ever-increasing speed and efficiency, and lower costs. His vision for microminiaturization set the stage for so many of the technical achievements we’ve seen over the past five decades.

Speaking of the transistor, we celebrate the 75th anniversary of the transistor this very year. Born in the fabled Bell Labs facility in New Jersey, the transistor led to the integrated circuit in the 1950s at Fairchild Semiconductor...the integrated circuit led to the microprocessor a decade later in the '60s: the first one had around 2,300 transistors on a single chip.

What’s next? Well, just last year, Intel announced its intention to develop a processor chip with one trillion transistors aboard, by the end of this decade.

A remarkable achievement, just as predicted by Gordon Moore.

In addition to tonight’s distinguished honorees, we are pleased to be joined by Yvette Kanouff, our most recent lifetime achievement honoree in technology. And we are once again thrilled to have David Pogue — our exemplary host for more than a decade — with us again tonight, to dazzle us with his ability to take technological categories like “Extraction of Granular Census Level Behavioral Data using ACR,” and turn it into a hummable tune!

In closing, I would also like to thank the NATAS national staff for its hard work and diligence in making tonight’s gala — and all of our national NATAS celebrations — shining moments in our industry, each and every year.

Thanks once again for joining us!

Terry O’Reilly

Chairman, NATAS

A MESSAGE FROM
THE PRESIDENT,
ADAM SHARP

Welcome to the 74th Technology & Engineering Emmy® Awards!

Tonight, we stand on the shoulders of Thomas Alva Edison and the many television pioneers that came after him. We stand also at the precipice of what may be the next greatest change in television and broader society since the invention of the internet: Artificial Intelligence. Every day, there’s another new iteration as OpenAI (ChatGPT), Microsoft (Bing), Google (Bard), and others develop new ways for this technology to enhance our lives. How these new tools will enhance the television experience is in the hands — and minds — of many of you whom we honor this evening. I for one can’t wait to see what you come up with!

It takes a large team to make an event like this possible, though I especially want to thank Joe Inzirello and Dina Weisberger for their leadership as co-chairs of our Technology & Engineering Achievement Committee. It is through their guidance and vision that they, and the talented members of their committee, do the hard work to identify the significant technological advancements that we gather to honor tonight.

I also thank our national staff for helping to make tonight’s show a success and ask you to join me in saving a special round of thanks for our production team: Executive Producer Lisa Armstrong, Director Nic Dugger and Writer/Editor Steve Ulrich.

Enjoy the evening!

Adam Sharp

President & CEO



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DAVID POGUE

Photography by Marc Bryan-Brown
Photos from the event can be viewed at
www.bryan-brown.com

ABOUT NATAS

The National Academy of Television Arts & Sciences (NATAS) is a service organization dedicated to the advancement of the arts and sciences of television and the promotion of creative leadership for artistic, educational, and technical achievements within the television industry. It recognizes excellence in television with the coveted Emmy® Awards for News & Documentary, Sports, Daytime, and Children’s & Family programming, as well as achievements in television Technology & Engineering.

NATAS membership consists of more than 18,000 broadcast and media professionals represented in 19 regional chapters across the country. Beyond awards, NATAS has extensive educational programs including regional student television and its Student Award for Excellence and the National Student Production Awards for outstanding journalistic work by high school students, as well as scholarships, publications, and major activities for both industry professionals and the viewing public.



NATIONAL
ACADEMY
OF TELEVISION
ARTS & SCIENCES

HONOREES

The National Academy of Television Arts & Sciences (NATAS) was founded in 1955. It is dedicated to the advancement of the arts and sciences of television and the promotion of creative leadership for artistic, educational and technical achievements within the television industry. It recognizes excellence in television with the coveted Emmy® Award. The Technology & Engineering Emmy® Awards are awarded to a living individual, a company, or a scientific or technical organization for developments and/or standardization involved in engineering technologies that either represent so extensive an improvement on existing methods or are so innovative in nature that they materially have affected television. Here are this year's honorees:

INVENTION AND DEVELOPMENT OF THE PINNED PHOTODIODE NOW USED IN MOST IMAGE SENSORS

Awarded to Nobukazu Teranishi and NEC

Nobukazu Teranishi

Orchestrating a brighter world

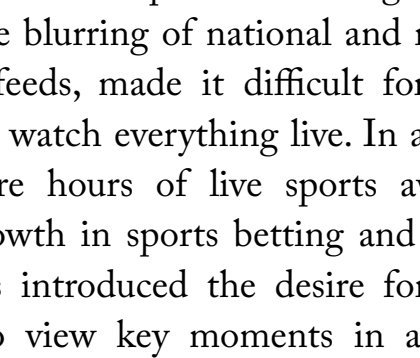


In 1980, a team led by Nobukazu Teranishi at NEC patented an image sensor architecture that, in the words of the U.S. version of the patent, shows “a solid-state imaging device that is free from an image lag can be provided with an extremely simple structure.” In a paper published in the 1982 Proceedings of the International Electron Devices Meeting (IEDM), Teranishi and an NEC team described the 1980 invention and added additional anti-blooming chip architecture. In 1984, the sensor design was first referred to as a “pinned photodiode” (PPD) in a Kodak paper; the Teranishi IEDM paper is the first reference in the Kodak paper.

A 2014 paper in the IEEE Journal of the Electron Devices Society, reviewing the PPD, begins “The ‘pinned photodiode’ is a photodetector structure used in almost all charge coupled device (CCD) and CMOS image sensors (CIS) due to its low noise, high quantum efficiency and low dark current.” Only a few image sensors intended for specialized scientific work do not use the PPD.

DIGITAL CINEMA CAMERA MOUNTED VIDEO EXTENDER FOR LIVE AUDIENCES

Awarded to MultiDyne and ARRI



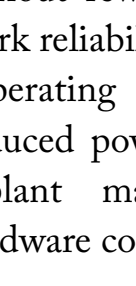
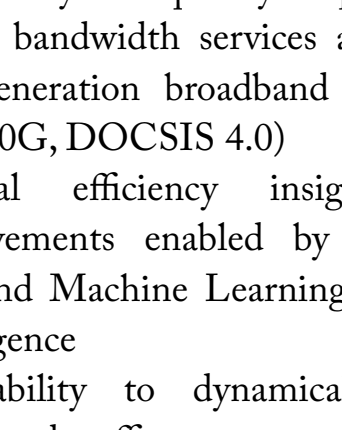
Many high-end productions for live events have replaced film-based workflows with 4K digital cinema cameras, in order to deliver a “cinema look” to a live audience. To make this workflow possible, a camera-mounted device is required to extend uncompressed, 4K signals from the on-set digital cinema camera to the control room, where it is produced for sending to live audiences. High-powered, extremely compact systems have been developed to extend from the camera control unit (CCU) base to the camera via hybrid cable that provide power and video connectivity for the entire cinema camera rig. Outboarding the CCU to the studio area removed one of the major obstacles to this technology — the noise generated by cooling fans which would be detrimental to a live telecast.

ARTIFICIAL INTELLIGENCE – MACHINE LEARNING CURATION OF SPORTS HIGHLIGHTS

Awarded to WSC, IBM, Comcast, and Google



WSC Sports



COMCAST



In the past 10 years, US TV broadcast hours for sports grew approximately four times in tonnage. This trend, coupled with the launch of sports streaming services and the blurring of national and regional game feeds, made it difficult for sports fans to watch everything live. In addition to more hours of live sports available, the growth in sports betting and fantasy leagues introduced the desire for sports fans to view key moments in a timely manner. With so much content for sports fans to consume, the ability to automate producing relevant highlights in near-real-time has become an integral part of the shift in how sports is consumed today.

Several systems are in use today, relying on primary analysis of the video and/or secondary classifiers, (e.g. scoreboard graphics, audio of audience reactions or announcers’ game calls), to identify and produce highlight videos in rapid fashion. Leagues, teams, and sports networks widely use these videos to enhance sports viewing producing millions of highlights, an amount incapable of being achieved with traditional editing processes.

PIONEERING DEVELOPMENT AND DEPLOYMENT OF VIRTUALIZED CABLE MODEM

Awarded to Harmonic, Comcast, and Intel

COMCAST

Virtualized Cable Modem Termination Systems (vCMTS) are transforming the broadband industry by enabling rapid scaling of access networks necessary for the delivery of IP-based video. vCMTS implements the management, control and data processing elements of a traditional cable modem in software running on “off the shelf” servers. The scaling advantages of this new software-centric approach include:

- The ability to quickly deploy new, higher bandwidth services and adopt next-generation broadband standards (e.g., 10G, DOCSIS 4.0)
- Spectral efficiency insights and improvements enabled by real-time data and Machine Learning/Artificial Intelligence
- The ability to dynamically move broadband traffic to new or alternative locations without rewiring, increasing overall network reliability
- Lower operating expenditures, including reduced power and cooling, simplified plant maintenance and decreased hardware costs

EXTRACTION OF GRANULAR CENSUS LEVEL BEHAVIORAL DATA USING ACR

Awarded to Cognitive Networks, Enswers, Turner Media lab

WARNER BROS. DISCOVERY

Television has historically suffered from the lack of census data and relied for years on proxies, and sampling techniques. That has made certain forms of measurement, including niche program audiences or more advanced queries, about viewer behavior unattainable. Further, new techniques in targeted advertising and marketing require much more precise data to determine who are the proper targets, how to calculate effective reach, frequency caps, or the like. The development of robust census measurements for TV viewing required granular viewing data. The size, noisiness, and network limitations made this collection and analysis more difficult than in an environment such as the Internet. Automatic Content Recognition (ACR) is a technology that solves this problem by generating and storing granular viewing data on a device-by-device (“TV-by-TV”) basis. Visual “fingerprints” embedded in video programming are detected by recent generations of “smart” television sets and sent to research servers that verify the programming and generate viewing data.

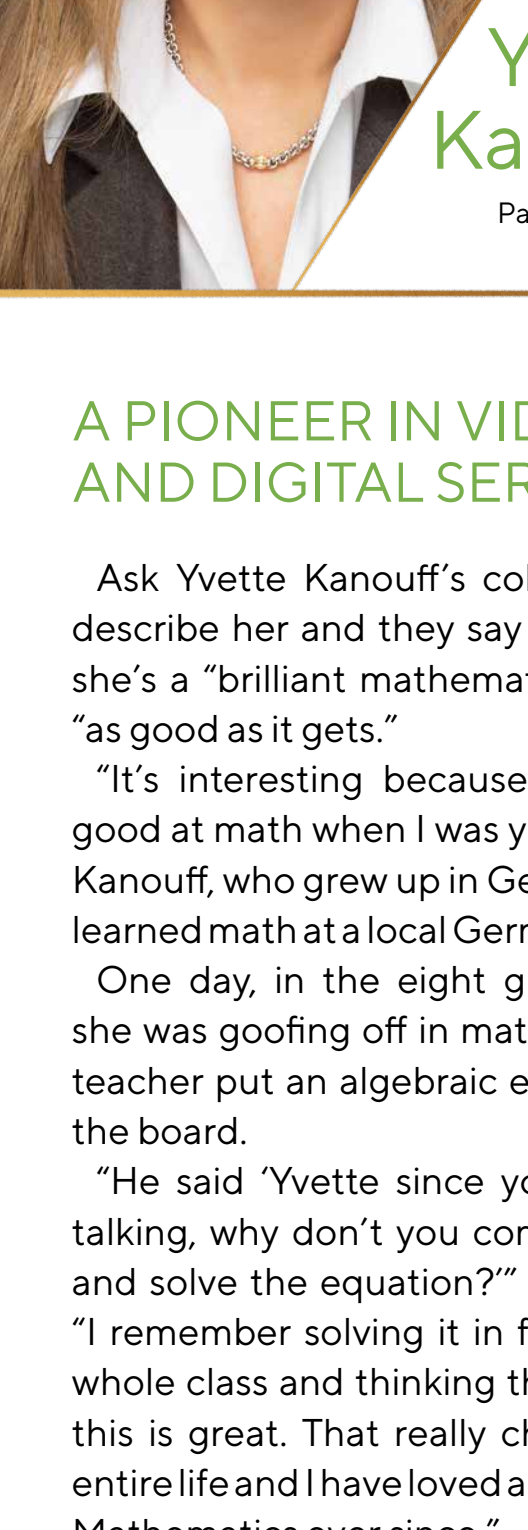


Congratulations to all the honorees.

VIZIO is proud to be recognized as an innovative leader in the Smart TV evolution, utilizing data to deliver best-in-class entertainment experiences for consumers and partners.

VIZIO

LIFETIME ACHIEVEMENT HONOREE



Yvette Kanouff

Partner and CTO,
JC2 Ventures

A PIONEER IN VIDEO AND DIGITAL SERVICES

Ask Yvette Kanouff's colleagues to describe her and they say things like: she's a "brilliant mathematician," and "as good as it gets."

"It's interesting because I was not good at math when I was young," says Kanouff, who grew up in Germany and learned math at a local German school.

One day, in the eighth grade, while she was goofing off in math class, her teacher put an algebraic equation on the board.

"He said 'Yvette since you feel like talking, why don't you come up here and solve the equation?'" she recalls. "I remember solving it in front of the whole class and thinking this was fun, this is great. That really changed my entire life and I have loved and pursued Mathematics ever since."

Kanouff ended up taking every available math class in her high school by the eleventh grade, and, she never looked back.

"I'm a big believer in helping kids at that transition point where they say they really hate STEM topics," she says. "I don't think they really hate it. I think they have stopped understanding it. And if you can understand it, everyone would think it was fun. You are solving puzzles."

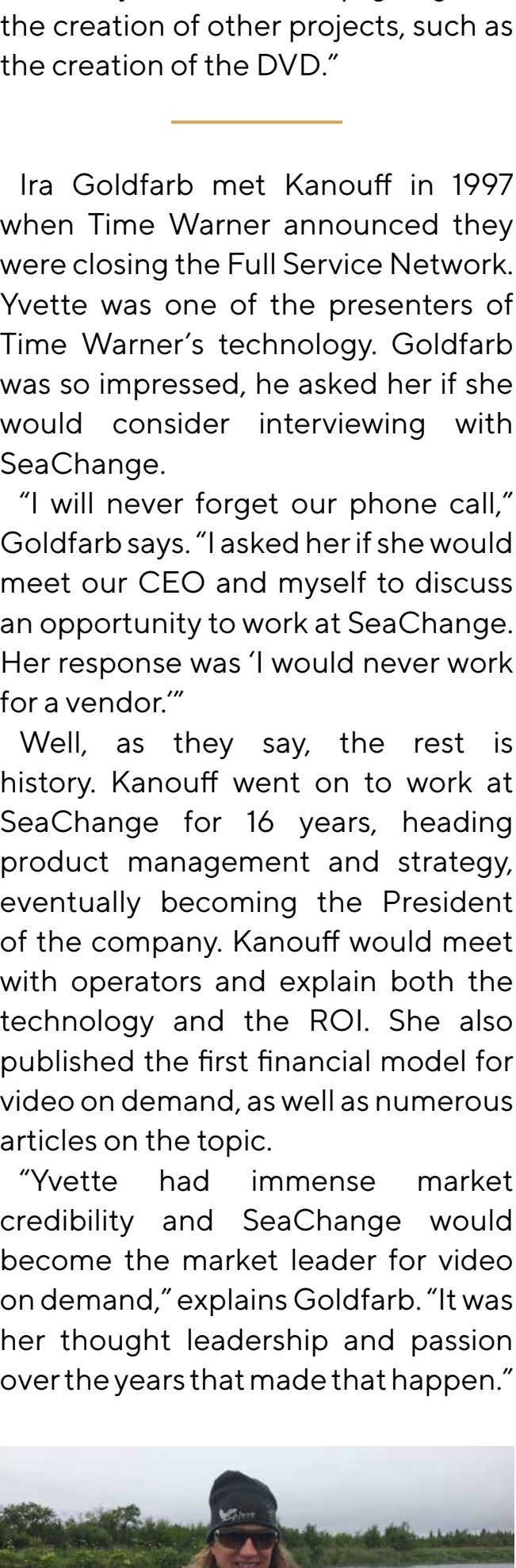
In 1993, Jim Ludington, who was vice president of technology at Time Warner Cable at the time, was hiring a group of people to do something that had never been done before: invent interactive television. Ludington was seeking people with great attitudes, and the aptitude to make it happen.

"This person comes in, and we have this great discussion and I can tell she's just brilliant," Ludington recalls. "You could see Yvette's mind was just grinding through the solutions, but outwardly she had 'that look' that she just wanted to reach across the table and kick your butt. It was hysterical."

Ludington hired her for the Full Service Network, which years later, won a Prime Time Emmy® for changing the face of television. But at that time, Ludington says, all they had was notebooks full of technology that they were going to integrate. Shortly after, Ludington remembers Yvette and various technology partners coming up with the first digital video compression and transport implementation.

"This was all the rage, to make the next generation of cable television," he recalls. "And Yvette would just go on about 'fractals versus wave lengths' in digital compression. I had no idea what she was talking about, but she could debate it from both sides."

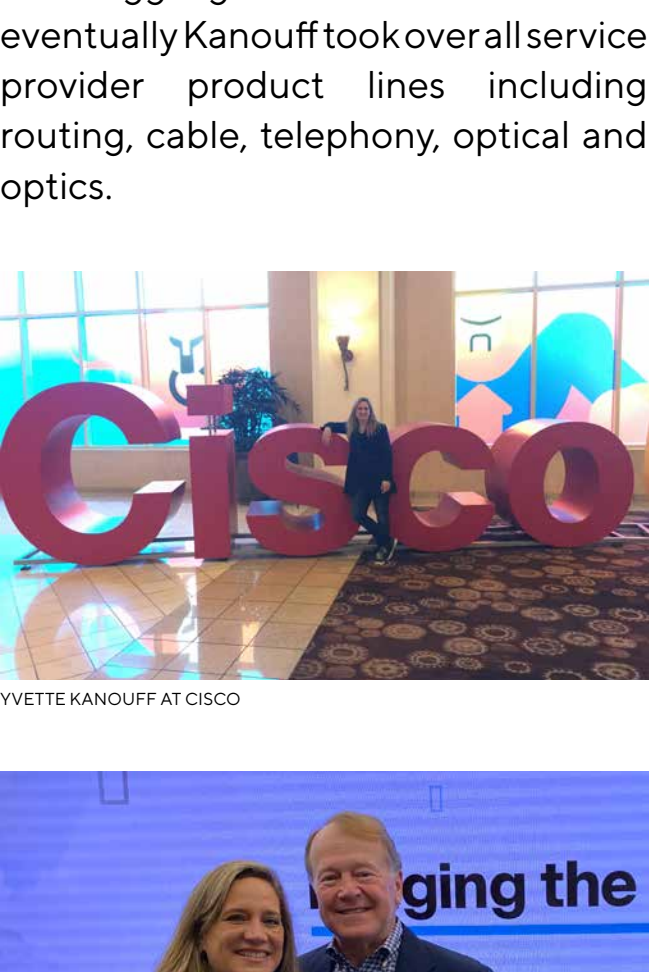
"I obviously felt strongly about video on demand [being widely adopted]," Kanouff remembers. "The industry did not see what you have today: streaming video, and every bit of video on demand on any device, anywhere."



YVETTE KANOUFF WITH ERIC SCHMIDT (PRIOR CEO OF GOOGLE) AND HENRY KISSINGER (FORMER US SECRETARY OF STATE)

Kanouff spent a lot of time telling senior executives "this is the future, everyone will want to see television when they want to." There were no smart phones, no mobile devices and all she heard back was "Well...we think web on TV is going to be more important."

But Kanouff stuck to her guns: "No, it's going to be video, whenever you want it, however you want it." In the end, history speaks for itself.



YVETTE KANOUFF WITH CHUCK DOLAN, FOUNDER OF CABLEVISION

The team also launched what was the predecessor of the app store.

"So much of the technology started on a TV," Kanouff recalls. "The work we did to figure out how to compress and deliver this video, it's not just the technology of video on demand. It was the entire infrastructure, and some of that early work ended up going into the creation of other projects, such as the creation of the DVD."

Ira Goldfarb met Kanouff in 1997 when Time Warner announced they were closing the Full Service Network. Yvette was one of the presenters of Time Warner's technology. Goldfarb was so impressed, he asked her if she would consider interviewing with SeaChange.

"I will never forget our phone call," Goldfarb says. "I asked her if she would meet our CEO and myself to discuss an opportunity to work at SeaChange. Her response was 'I would never work for a vendor.'"

Well, as they say, the rest is history. Kanouff went on to work at SeaChange for 16 years, heading product management and strategy, eventually becoming the President of the company. Kanouff would meet with operators and explain both the technology and the ROI. She also published the first financial model for video on demand, as well as numerous articles on the topic.

"Yvette had immense market credibility and SeaChange would become the market leader for video on demand," explains Goldfarb. "It was her thought leadership and passion over the years that made that happen."



YVETTE KANOUFF

In 2012, after 16 years at SeaChange, they went their separate ways and Kanouff went to Cablevision as their CTO. There she continued to innovate with the Cablevision team on cloud DVR and interactive advertising, both of which won Emmys® for the company.

With her extensive experience both on the vendor and operator side, she went to run the video business at Cisco Systems. Goldfarb would join her there, two years later.

At Cisco, they turned around a struggling video business and eventually Kanouff took over all service provider product lines including routing, cable, telephony, optical and optics.

YVETTE KANOUFF AT CISCO

YVETTE KANOUFF WITH JOHN CHAMBERS, CHAIRMAN EMERITUS OF CISCO AND THE "GODFATHER OF SILICON VALLEY"

"As she assumed more and more responsibility, so did I," Goldfarb recalls. "She was amazing to work for."

"She's just someone you could trust with your life, bottom line, she's as good as it gets," says John Chambers, former executive chairman and CEO of Cisco Systems. "When you talk about innovation, talk about making a difference in the world, you talk about just talent and inclusion, and being able to handle tremendous opportunities and deal very effectively with challenges, I think she's at the very top of the whole industry."

"And I think she's the top female in the world in the engineering category," adds Chambers, who continues to work with Kanouff at his JC2 Ventures company, where they focus on next-generation technologies and start-ups.

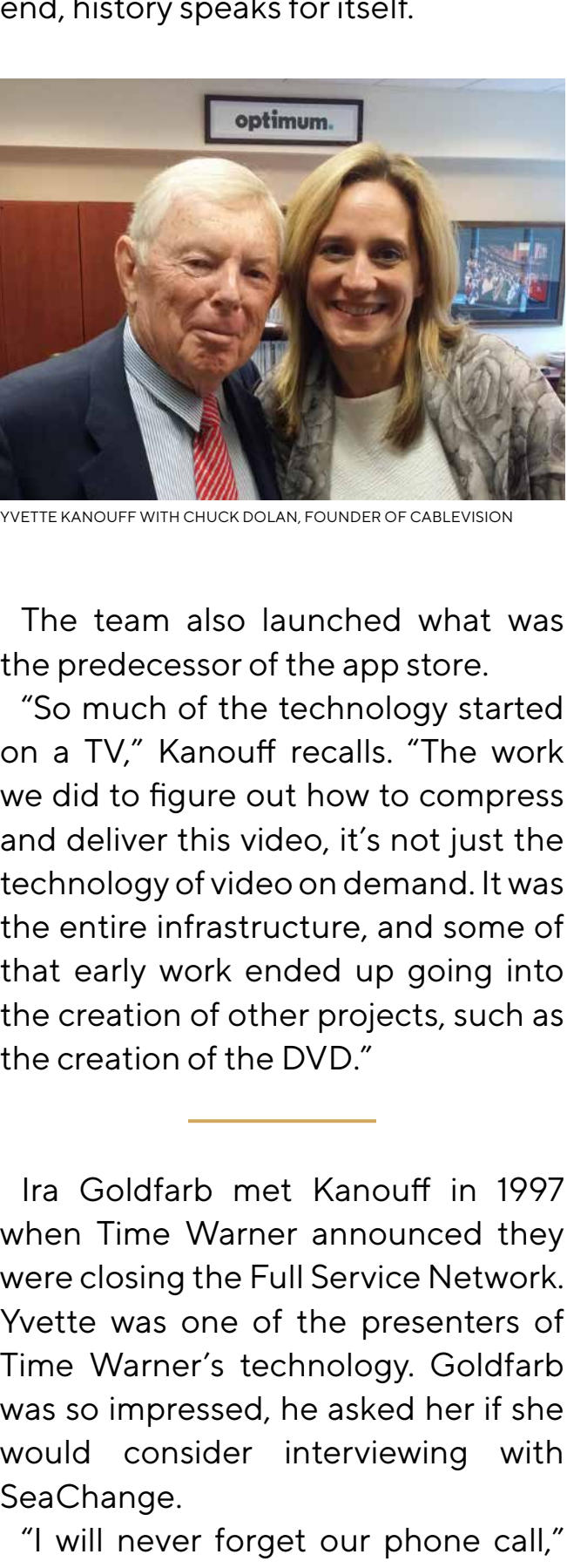
"Yvette is an extraordinary person. More than any other female professional I know, she truly owns being a woman in a male-dominated field," says Nomi Bergman, President of Advance. "Most of her career, Yvette has been surrounded by men. One of my favorite stories, which she tells, is of a baby shower her all-male colleagues threw for her at a pizza parlor where they served beer. And she loved it, even though she couldn't join in for the beer."

Bergman says one thing that sets Kanouff apart, is that she's truly committed, to doing what she can, to ensure that the next generation of female technology leaders is a much larger one. "Having a Puerto Rican father, and being female, I have to say, it was painfully obvious that there were few women and minorities in the technology field," Kanouff says. "So, I have always thought, how can I help change that?"

"As a women leader in a very male dominated field, Yvette made it a goal to lift women and diverse talent up," says her friend Marci Hanlon, vice president, global service provider marketing at Cisco.



YVETTE KANOUFF AND HER HUSBAND AT ROYAL ASCOT



YVETTE KANOUFF WITH BRIAN ROBERTS, CHAIRMAN AND CEO OF COMCAST

Hanlon says one example is a movement she launched in 2016 called The Multiplier Effect, which encourages and enables leaders across all industries to sponsor extraordinary, diverse talent.

She says research from the Leadership Research Institute shows that people who have sponsors are 23 percent more likely to advance in their careers. Women and minorities are significantly less likely to have a sponsor. Kanouff's program has been picked up by many companies, and Cisco continues to tout the program's benefits.

It is because of women, like Kanouff, that real change is now underway for minorities and women.

"I do think things are improving," says Kanouff. "And I am very encouraged by that." ●

TELEVISION ENGINEERING PIONEERS

by Mark Schubin

Under its current rules, the Academy imposes an additional obligation on individuals over companies or organizations. Aside from their work having to “materially have affected television,” individuals must also be alive. The Technology and Engineering Awards Committee has enough work judging achievement without having to deal with issues of probate.

Nevertheless, after a demonstration of the Siemens artificial eye (honored with Emmy® Award recognition in 2017), there has not been a single year since 1877 without significant television engineering work taking place, and much of that work was by individuals not associated with companies or organizations. Two of the oldest companies to have been honored with Emmy® Awards, AT&T and General Electric, for example, were both established long after 1877.

The Television Engineering Pioneers List, therefore, was established by the Academy to honor those deceased individuals whose efforts materially have affected television but have not yet been recognized by an Emmy® Award and have been deemed ineligible to be recognized by a future Emmy® Award. Pioneers List candidates are investigated and evaluated just as Technology and Engineering Emmy® Award candidates.

The list already has members from France, Germany, Ireland, Poland, Portugal, the United Kingdom, and the U.S. It is expected that new members will be added each year.

These are the previous inductees:

❶ “THE CLASS OF 1877” – GEORGE ROSWELL CAREY, ADRIANO DE PAIVA, FREDERICK HARRISON GLEW, JULIJAN OCHOROWICZ, WILLIAM EDWARD SAWYER, AND CONSTANTIN-MARIE SENLECQ

❷ EARLIEST-KNOWN VIDEO IMAGE – DENIS DANIEL REDMOND

❸ ESTABLISHING TELEVISION RESEARCH AS REAL – WILLIAM EDWARD AYRTON, JOHN PERRY, AND SHELFORD BIDWELL

❹ A VISIONARY – MAURICE LEBLANC

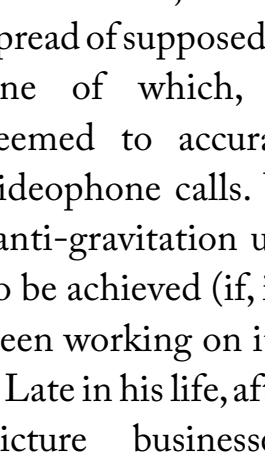
❺ FIRST TELEVISION PATENT – PAUL GOTTLIEB NIPKOW

These are the 2023 inductees:

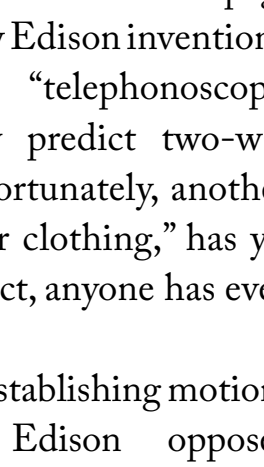
❻ THE REFLECTORS – LLEWELYN BIRCHALL ATKINSON AND JEAN LAZARE WEILLER

Nipkow’s perforated rotating scanning disk might have inspired the era of electromechanical television — which included the earliest television broadcasts — but it had a problem. In both “transmitter” (camera) and “receiver” (display), it allowed only a small amount of light to pass through the perforation. Some developers tried solving the problem with lenses instead of tiny perforations, but those made the disks heavier, more difficult to spin, and more dangerous. Atkinson and Weiller came up with a different idea (possibly even before Nipkow): a rotating mirror wheel or drum.

Born on August 27, 1863, Atkinson was not yet 19 years old when he first published about television in *English Mechanic and World of Science* in its April 21, 1882 issue. He had studied under Pioneers List member William Ayrton and in 1881 won the Silver Medal with Honours at the first examination held by the City and Guilds on electric lighting and power transmission. In 1889, reacting to an article about Weiller’s work, Atkinson said he had built “an identical apparatus” in 1882 and still had the models; the models are now in the collection of the Science Museum Group, which accepts the 1882 date.



LLEWELYN BIRCHALL ATKINSON



JEAN LAZARE WEILLER

Born in 1858 in Alsace, Weiller in 1889 published a description of a television system using a mirror wheel. Weiller credited the work of Jean Antoine Lissajous on vibrating mirrors as his inspiration, but television historian André Lange indicates that Weiller had studied in London in a time frame that could have allowed awareness of Atkinson’s work. There is no known documentary evidence that can prove Atkinson’s claim, but Atkinson approved of Weiller’s work.

Unlike the Nipkow disk, the rotating mirror wheel or drum allowed much more of the light to be used. Whereas early Nipkow-disk-based television displays had tiny images, those using mirror drums offered the first possibility of large video screens in homes.

❼ THE INFLUENCERS – THOMAS ALVA EDISON, JAN SZCZEPANIK, AND CONSTANTIN DMITRIEVICH PERSKYI (IN RUSSIAN КОНСТАНТИН ДМИТРИЕВИЧ ПЕРСКИЙ):

Beginning with reports of the Siemens “eye” in 1876, research into television technology took off, with the first crude images demonstrated by Pioneers List member Denis Redmond shortly thereafter. By the end of the 19th century, however, little more seemed to have been achieved. Obscure inventors came up with more schemes, but there seemed little interest on the part of the public that would keep researchers working to achieve the dream. Three influential engineers changed that.

Long before his first public demonstration of motion-picture technology, Edison was already the world’s most famous inventor. *Punch’s Almanack for 1879*, published on December 9, 1878, featured a multi-page spread of supposed new Edison inventions, one of which, the “telephonoscope” seemed to accurately predict two-way videophone calls. Unfortunately, another, “anti-gravitation under clothing,” has yet to be achieved (if, in fact, anyone has even been working on it).

Late in his life, after establishing motion-picture businesses, Edison opposed television, a competing technology. He was quoted in *The New York Times* in 1927 as saying television was “possible, but of very little general value. It’s a stunt.” In 1930 the same newspaper quoted him as saying “Locomotives are pretty well developed, but you wouldn’t want to buy one and have it in your house, would you? Television is like that.” In between, he told an interviewer television “will hardly be practical for general use.”

Earlier, however, when he was seeking the contract to provide electrical lighting for the World’s Columbian Exhibition in Chicago, he held a press conference there in 1891. It was covered by news media worldwide, and, in it, asked what he might exhibit at the event, he suggested what we would today refer to as color television via cable. According to *The Chicago Evening Post* coverage, Edison did indicate that certain aspects of the invention were still wanting. “But you will be able to supply that want!’ some one anxiously inquired. Mr. Edison smiled by way of reply and in a way that all doubts were swept away.”

Edison was awarded more than a thousand patents in the U.S., alone, in his lifetime. Polish inventor Jan Szczepanik was said to have been awarded only “several hundred.” Nevertheless, Mark Twain (Samuel Clemens) referred to him as “the Austrian Edison” in non-fiction reports of his work and featured him in a fiction story, “From the ‘London Times’ of 1904” (published in 1898). Both told of his work on television, which Twain called the “teleelectroscope” (it was more commonly called the “telectroscope”).

Szczepanik was born in what was then called the Austrian Partition, in what is now part of Ukraine, but he moved, as an infant, to what is now part of Poland. His inventions ranged from aircraft to submarines, and from bulletproof vests to color photography and sound recording, but it was his television work that captured the imagination of the public. He was unable to create a commercially viable system, however, and was reportedly unable to sell his television patents in 1906.

Constantin Perskyi was not as well known as either Edison or Szczepanik, not even in his native Russia, where he was a member of the nobility and a professor and ultimately achieved the rank of major general. In 1899, he presented a report to the first All-Russia Electrotechnic Congress on (translated) “The current state of the issue of electric vision at a distance.” The report significantly included Russian developments not well covered elsewhere. The word he used for “electric vision at a distance” was pronounced *televizirovaniye*.

In 1900, Perskyi repeated his report on the afternoon of August 24 to the International Electrical Congress at the world’s fair in Paris. For an audience of non-Russian-speakers, he needed to come up with a different term. He did.

Perskyi’s influence on the industry may be judged by how well his term was adopted. He called the new technology “television.”

More information on the Television Engineering Pioneers List may be found at <https://theemmys.tv/tech/pioneers/> ●

TECHNOLOGY & ENGINEERING EMMY® AWARDS



THE NATIONAL ACADEMY OF TELEVISION ARTS & SCIENCES

A Non-Profit Association Dedicated to
the Advancement of Television

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THIS YEAR'S HOST:

DAVID POGUE



David Pogue was the *New York Times* weekly tech columnist from 2000 to 2013. He's a six-time Emmy® winner for his stories on *CBS Sunday Morning*, a *New York Times* bestselling author, a five-time TED speaker, host of 20 *NOVA* science specials on PBS, and creator/host of the CBS News/Simon & Schuster podcast *Unsung Science*.

He's written or cowritten more than 120 books, including dozens in the *Missing Manual* tech series, which he created in 1999; six books in the *For Dummies* line (including *Macs*, *Magic*, *Opera*, and *Classical Music*); two novels (one for middle-schoolers); his three bestselling *Pogue's Basics* books of tips and shortcuts (on *Tech*, *Money*, and *Life*); his how-to guides, *iPhone Unlocked* and *Mac Unlocked*; and his 2021 magnum opus, *How to Prepare for Climate Change*.

After graduating *summa cum laude* from Yale in 1985 with distinction in music, Pogue spent ten years conducting and arranging Broadway musicals in New York. He has won a Loeb Award for journalism, two Webby awards, and an honorary doctorate in music. He lives with his wife Nicki and their blended brood of five spectacular children in Connecticut and San Francisco.

On Twitter, he's @pogue; on the web, he's at www.davidpogue.com. He welcomes email at david@pogueman.com.



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